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Persistent Paradoxes in Pluralistic Organizations: A Case Study of Continued Use of Shadow-IT in a French Hospital

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Completed Research Paper

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Abstract

In times when employees increasingly use private IS in their workplaces, organizations need to bring into balance use of authorized with non-authorized systems. We entered the field with the aim to understand how this is possible but ended up seeing a paradox: Doctors in a French hospital continued to use WhatsApp and other technologies to share sensitive patient data and management let them proceed despite the fact that this practice violated the law and numerous organizational policies. Using grounded theory methodology, we increasingly understood that the underlying problem was one where over-arching institutional logics informed agency of different groups within the organization whose pragmatic decisions to go about their work let the paradox that we saw persist. We thus build theory around why paradoxes persist in organizations and contribute to research on paradoxes and institutional logics, respectively.

Keywords: Paradox, institutional logics, persistence, grounded theory, health care-IT, shadow IT

Introduction

Organizations around the world have been concerned about their employees using non-authorized IS for their work for a long time (see, for example, Fürstenau et al. 2017). A relatively recent development in this regard is that employees can use messengers such as WhatsApp to conveniently share information with colleagues or even business partners. As messengers exchange information swiftly and at seemingly no costs, their application in business contexts has increased, raising questions about compliance with the law, organizational policies, and ethics; particularly when sensitive data is involved. Managements must thus find ways to control use of such non-authorized IS and, ideally, promote conversion of users from non-authorized to authorized systems.

We entered the field with the intent to understand how it would be possible to keep use of non-authorized IS at bay and bring it into balance with the use of authorized IS. To this end, we traced the impact of a project that was supposed to alleviate doctors' use of non-authorized IS in a French hospital that we call 'Hospital'. However, we were puzzled to see that the project had little success despite significant investments being made. Hospital's management aborted the project and, instead of trying to make doctors use a particular platform technology, it let them continue to use WhatsApp and other messengers to share patient data even though it violated the law and numerous organizational policies. How was it possible that this paradox occurred and persisted? Relying on grounded theory methodology (Corbin and Strauss 2008),

we began iterating between our empirical material, data analysis, and existing theory in order to theorize our observations. Drawing on paradox theory from organization science (Smith and Besharov 2019; Smith and Lewis 2011) and IS (Gregory et al. 2015) we conceptualized doctors' use of a highly problematic technology as paradox because the technology enabled swift data exchanges to facilitate treatments, but also put Hospital at risk of being sued should patients become knowledgeable about their data being shared via messengers. However, our data also revealed that the paradox persisted despite significant managerial effort to alleviate it. While literature on paradoxes generally insists on their 'persistence' (Robey and Boudreau 1999; Smith and Lewis 2011), it tells us little about how to conceptualize 'persistence of paradoxes' and its drivers. This made us ask "*why do paradoxes persist over time?*' Through further iterating between data and theory, we found diverging institutional logics to surround Hospital and prescribe contradictory goals (Pache and Santos 2010). They provided agency to different organization members who pragmatically decided what IT to use in order to reach these respective goals. Micro-level agency of different groups thus rendered the organization-level paradox persistent, which implies to see persistence not as antithesis to agency as some earlier research suggests (Jansen 2004; Sydow et al. 2009) but as an outcome of the agency of different groups.

Our contributions are three-fold. First, we develop a model of how paradoxes persist whereas earlier research has focused on how they become resolved (Gregory et al. 2015; Robey et al. 2002; Robey and Boudreau 1999). Secondly, whereas earlier research on institutional logics has shown that loose coupling (Berente and Yoo 2012) and resistance (Berente et al. 2019) can follow as responses to IS implementation, we highlight paradoxes as a third and different outcome. Finally, through showing that organization-level persistence of paradoxes results from a micro-level agency, we suggest seeing persistence not only as antithesis to agency but as one of its outcomes.

Theoretical Background

Our focus on the persistence of paradoxes earned its way into our study as we iterated between data and literature; a process not unusual for papers using the grounded theory methodology (Suddaby 2006). Consistent with other papers of this like though (Berente and Yoo 2012; Gregory et al. 2015) we introduce our key theoretical ideas upfront in order to accommodate the reading flow.

The Concept of 'Paradox' in Organization Theory and IS Research

Literature in the fields of organization theory (Jay 2013; Smith and Besharov 2019; Smith and Lewis 2011) and IS research (Gregory et al. 2015; Robey and Boudreau 1999) is increasingly attending to the role that 'paradoxes' play for managing contemporary organizations. A 'paradox' has been defined as "contradictory yet interrelated elements that exist simultaneously and *persist* over time" (Smith and Lewis 2011, p. 382, mark-up added) or as "a statement expressing or asserting the opposite of another statement" (Robey and Boudreau 1999). A common example of a paradox is that organizations need to innovate in new products and services while they also need to maximize the efficiency gains associated with refining their production technology (Smith and Tushman 2005). As these two goals differ substantially, but need to be pursued simultaneously, managements frequently face paradoxical demands (Gregory et al. 2015; Smith and Lewis 2011). However, paradoxical demands need not be seen as antithetical to performance or anyhow undesirable. Instead, thinking in terms of paradoxes and how to manage them is increasingly understood as important even decisive for organizational success (Jay 2013; Smith and Besharov 2019; Smith and Lewis 2011): "Rather than advise managers to eradicate paradox through rational programs, the emerging literature urges managers to embrace paradoxical thinking as a stimulus for more complex and more creative solutions" (Robey and Boudreau 1999).

IS researchers have studied paradoxes particularly in contexts of organizational change and transformation where paradoxes arise when some forces promote persistence while others promote change (Gregory et al. 2015; Robey and Boudreau 1999). For example, in their study of transformation of a large German bank, Gregory et al. (2015) identified IT portfolio decisions as one area where paradoxes matter greatly. When making these decisions, managers need to balance demands for boosting efficiency of existing operations versus investing in novel IT that enables innovation in products and services (Gregory et al. 2015). Furthermore, Robey et al. (2002) explained the difficulties of many organizations to successfully implement ERP systems by paradoxes arising from new knowledge inscribed into the business processes implemented in an ERP system versus established knowledge manifested in business processes that an organization

executed before the ERP systems was implemented. Both knowledge bases matter for successful implementation, but managers frequently struggle to embrace them simultaneously.

One important aspect of conceptualizing paradoxes is that it builds on a logic of opposition rather than a deterministic logic that associates IT with causing particular outcomes (Robey and Boudreau 1999). A logic of opposition assumes that there are latent contradictions between opposing forces that can play out during learning, organizing, and other organizational processes (Smith and Lewis 2011). For example, persistent tensions between the expectation that ERP systems increase financial performance through standardizing practices versus the observation that these practices vary substantially (Berente and Yoo 2012) is seen as starting point for theorizing paradoxes and not as a deviation from the norm. This broad and general observation also suggests that 'paradox' is not a theory in its own right, but a meta-theoretical lens (Gregory et al. 2015; Smith and Lewis 2011) as paradoxes can occur in various contexts. Robey and Boudreau (Robey and Boudreau 1999) thus suggested to study paradoxes from lenses such as organizational culture, learning, politics, as well as institutional theory (see below). The latter has the potency to capture how prescriptions of competing values inform organization-level paradoxes (Robey and Boudreau 1999).

Furthermore, another aspect linked to conceptualizing paradoxes is that extant research has mainly attended to managerial response strategies aimed at resolving paradoxes (Jay 2013; Smith and Besharov 2019; Smith and Lewis 2011). For example, in Gregory et al.'s (2015) study of a large bank, successful IT portfolio decisions would be made when managers were mindful about both the efficiency gains involved in these decisions as well as the potential of these decisions to inform further innovation. Similar observations have been made outside of the IS context (Jay 2013; Smith and Besharov 2019).

Even though most of the abovementioned studies have elaborated on Smith and Lewis' (2011) seminal conceptualization of paradoxes, there are areas in which to further develop this work. Persistence of paradoxes is an important part of Smith and Lewis' (2011) argument, in fact, persistence of opposing tensions is central for paradoxes to occur and re-occur (Robey and Boudreau 1999). However, few studies have delved into the idea of 'persistence' as most works have focused on strategies to resolve paradoxes. Studying persistence of paradoxes calls for a more dynamic, process-oriented understanding of paradoxes (Robey and Boudreau 1999) and organization theorists are currently making first steps into that direction. Claus et al. (2016) attended to how paradoxes unfold on the level of an organizational field where paradoxes can become established and normalized over time. While one of the first studies to depart from a static view of paradoxes, their paper says comparatively little about how paradoxes persist in organizations and is completely silent about the role that IS may play for this phenomenon.

Using an Institutional Logics Perspective to Conceptualize IS-related Paradoxes

Paradoxes often arise from diverging institutional structures that guide organizational conduct (King et al. 1994; Robey and Boudreau 1999). For example, ERP systems are often associated with values that promote efficiency and clash with practices of organization members such as scientists (Berente and Yoo 2012), doctors (Boonstra et al. 2017; Hultin and Mahring 2014; Jensen et al. 2009), or public administrators (Beck et al. 2015) who organize their work on different grounds. Robey and Boudreau (1999) argued that such diverging principles arise from pluralistic environments that prescribe multiple sources of organizational legitimacy (see also, Seidel and Berente 2013). For example, NASA as public organization is supposed to economize on costs and use ERP for that purpose, while NASA's scientific integrity also depends on professional autonomy and academic independence (Berente et al. 2016; Berente and Yoo 2012). As some of these prescriptions push for IS implementation while others from a barrier to it, paradoxes arise (Robey and Boudreau 1999).

Organization theorists have begun to deepen the link between paradoxes and institutional structures by suggesting paradoxes to arise from contradictory institutional logics (Claus et al. 2016; Jay 2013; Smith and Besharov 2019). Logics are commonly defined as socially derived "guidelines on how to interpret and function in social situations" (Greenwood, Raynard, et al. 2011, p. 318) that emanate from an organization's environment (Thornton et al. 2012; Thornton and Ocasio 2017). Consistent with Robey and Boudreau (1999), this body of work attends to how several logics prompt the emergence of intra-organizational tensions that organizations need to grapple with (Greenwood, Díaz, et al. 2011; Raaijmakers et al. 2015; Smets et al. 2012, 2015).

Even though IS researchers have not explicitly linked logics with paradoxes, there are indications of paradoxical situations in much of the IS literature that has relied the concept of 'institutional logics'. This work typically contextualizes micro-level activities and practices within broader, macro-level logics (Boonstra et al. 2017; Hultin and Mahring 2014; Jensen et al. 2009; Seidel and Berente 2013) suggesting that different organization members can advocate various contradictory logics (Berente and Yoo 2012; Friedland and Alford 1991; Seo and Creed 2002). For example, a common problem in public organizations such as NASA is that scientists advocate logics of professionalism while management relies on managerial logics (Berente et al. 2016; Berente and Yoo 2012). Similar findings have been reported for public private partnerships (Beck et al. 2015) and hospitals (Boonstra et al. 2017; Hultin and Mahring 2014; Jensen et al. 2009) where the contradictions between professional and managerial logics characterized efforts to implement IT. IT and particularly ERP systems are understood to 'carry' logics of efficiency and optimization into organizations (Berente and Yoo 2012; Gosain 2004; Lyytinen et al. 2009) that frequently contradict professional logics emphasizing on autonomy and individual expertise (Beck et al. 2015; Berente et al. 2019; Boonstra et al. 2017; Jensen et al. 2009). The label "pluralistic organizations" has been evoked in order to capture the abovementioned situations (Berente and Yoo 2012; Kraatz and Block 2017). The idea is that organizations, which face multiple logics, experience their clashes during IS development and implementation and, hence, organizations become arenas within which pluralism of logics plays out (Berente et al. 2019; Greenwood, Raynard, et al. 2011).

As logics and their pluralism can be seen as contradictory structures that persist (Robey and Boudreau 1999), it is worth considering how the link between logics and paradoxes helps us understanding the persistence of the latter.

Towards an Understanding of how Institutional Logics inform Persistence of Paradoxes

Management and IS scholars alike have highlighted 'persistence' as important feature of paradoxes whose latency draws from comparatively stable yet opposing forces (Robey and Boudreau 1999; Smith and Lewis 2011). For example, Smith and Lewis' (2011) seminal work on paradoxes highlights persistence and calls for managerial response strategies to be organized in a 'dynamic equilibrium' mode where resolutions of paradoxes are seen as temporal only to last until a paradox resurfaces again (Robey and Boudreau 1999). Provided this importance of the notion of 'persistence', it is surprising that it has rarely been opened up in order to better understand paradoxes. This coincides with general organization theory where 'persistence' tends to be used as synonym for inertia (Jansen 2004), path dependence (Sydow et al. 2009), or rigidity (Gilbert 2005) yet little has been done to attend to 'persistence' more specifically.

According to the Oxford English Dictionary, persistence refers to the "(t)he action or fact of persisting in a particular state, opinion, purpose, or course of action, esp. despite opposition, setback, or failure; the quality or virtue of being persistent." (Oxford English Dictionary 2019) Building on this definition, we believe that it is important to focus on actions in order to further theorize around the persistence of paradoxes because what actors do contributes paradoxes being resolved or not (Gregory et al. 2015; Smith and Besharov 2019; Smith and Lewis 2011). This calls for relating actions of actors to underlying, potentially persisting forces that give rise to paradoxes and is thus consistent with earlier work on the links between local practices and wider institutional structures (Barrett and Walsham 1999; Berente and Yoo 2012; Oborn et al. 2011). In this view, actions are seen as dynamically evolving while potentially owing the patterns in which they evolve to more permanent structures (see also, Giddens 1984). Moreover, this is also consistent albeit not the same as process-based understandings of lock-in and path dependency that allow actions to unfold within trajectories without assuming actions to be determined (Singh et al. 2015; Sydow et al. 2012).

Linking the abovementioned ideas with the concepts of institutional logics and paradoxes affords, we believe, a new take on understanding persistence in the context of paradoxes. While much literature on inertia and path dependency (Jansen 2004; Sydow et al. 2009) has seen persistence as opposite to agency, taking into account institutional logics allows to see that paradoxes persist because of the agency that multiple actors have, as our empirical study suggests.

Research Design and Methods

This paper is based on an in-depth, three years case study of a French hospital coined 'Hospital' that we describe below (Klein and Myers 1999; Walsham 1995; Yin 2018). Keeping with principles of building grounded theory (Corbin and Strauss 2008), we iterated between data collection and analysis involving a 'back and forth' between data collection, analysis, and an emerging theoretical interpretation.

Sampling and Data Collection

We collected data from June 2014 until September 2017. We entered the field when Hospital started an initiative aimed to design an app that would enable medical professionals to take patient pictures with their personal mobiles and store these pictures in Hospital's electronic medical record (EMR) system. We were granted access by the manager of the 'Delegation for Hospital Information' (DHI), a doctor, who was tasked with implementing the app, which we call 'XPhoto'.

Data collection was organized into several interrelated steps described in Table 1. The first author collected over 400 hours of observational material as well as 16 interviews in order to understand practices related to 'patient picture processing' (PPP) and to understand how the implementation of XPhoto changed these practices. For example, this data revealed the technologies used for PPP, how pictures were captured, stored, shared, displayed, and which goals doctors pursued when they used particular technologies for PPP. The DHI manager provided an initial list of doctors, who would frequently take patient pictures, and the first author identified further informants via snowballing. A further author collected interviews with five doctors who were involved with testing XPhoto as well as one nurse involved with the test. Finally, the first author also collected data from interviews with the DHI manager as well as ten hours of observational data. In order to ensure accuracy of our analysis and minimize our impact on the field, we triangulated insights across sources and only included them here when multiple sources could confirm an observation. Moreover, one author was not involved in data collection and acted as 'out sider' who critically challenged emerging view and ideas suggested by the other two authors.

Time and duration	Subject	Interviews	Observation
January to June 2016	Understanding the practices related to PPP and the technologies used	16 Interviews with 3 nurses, 1 nurse manager, and 12 doctors 1 interview with the DHI manager	20h of meetings of 13 medical departments to discuss diagnoses of patients
September 2015 to September 2017	Meetings in the context of the implementation of XPhoto	2 interviews with the DHI manager	10h of meetings of the DHI related to the implementation of XPhoto
June 2016- June 2017	Practices related to PPP and the technologies used after the test of XPhoto	5 doctors and 1 nurse	5h of observation on meetings of 3 medical departments and of 2 nurses using XPhoto
June 2014- February 2016	Work practices of doctors		Approx. 400hrs of doctors' practices related to patient care

Table 1. Summary of Data used in this Study

Data Analysis

Our data analysis was built upon the principles of grounded theory (Corbin and Strauss 2008; Seidel and Urquhart 2013). Consistent with Berente and Yoo (2012), our analysis comprised these steps: First, we organized data in a database where all our materials were included (Yin 2018). Second, we engaged in open

coding, which enabled us to explore first emerging themes within the data (Corbin and Strauss 2008). Third, we employed axial coding to synthesize our data into categories and subcategories as well as more theoretical codes (Corbin and Strauss 2008). This did "not take the form of neat linear rounds of coding" (Berente and Yoo 2012, p. 380) but was a rather iterative process during which we consulted theory, our data, as well as the codes and categories that we had built with the intent to synthesize our observations in a theoretical argument (Corbin and Strauss 2008). This led to a central code; i.e. that "institutional logics guide the agency that enables paradoxes to persist" (see also, e.g., Berente and Yoo 2012). Once we had this code in place, we went back to the data and selectively coded it focusing on paradoxes, logics, and agency.

Findings

In this section, we review our case narrative in order to set the stage for theorizing our observations. As indicated, we accompanied Hospital through a project that aimed to integrate patient picture processing into a centralized EMR. The rationale for the project was that doctors would frequently use personal IS such as WhatsApp to process patient pictures, which was fundamentally at odds with Hospital's data security and privacy policies. However, after two years, Hospital decided to put the project on hold and tolerate doctors using WhatsApp and other messengers despite obvious risks involved.

Case Description

An Introduction to Hospital

Hospital is a French University Hospital with 2,700 beds and about 10,800 employees out of which 1,900 are doctors. Hospital provides primary, intensive, and emergency care, and offers all medical specialties. Provided it is an university hospital, Hospital has to pursue several goals at the same time; for example, providing excellent care, publish in well-regarded journals, doing influential clinical trials, training residents, monitoring clinical outcomes such as drug effects over time, and ensuring best possible efficiency as Hospital operates on public tax money.

As large hospitals frequently do, Hospital implemented an electronic medical record (EMR) in 2012 in order to integrate information from different intra-organizational sources and streamline business processes to the best possible extent. The EMR was rolled out across all units except emergency care and included computerized physician order entry, medical observations, prescriptions, and care sheets. With the EMR came a set of organizational changes associated with ensuring system maintenance, quality of information, and helping doctors with using the EMR appropriately so that use would be according to the law and other governmental prescriptions that would affect Hospital.

Using Non-authorized IS for Patient Picture Processing (PPP) at Hospital

PPP dealt with how employees of Hospital made medically relevant pictures of patients and shared them with each other. Hospital's policy would require personnel to store pictures only in the EMR and to share pictures using Microsoft's Sharepoint. No policy was in effect that would address sharing pictures with medical professionals working outside of Hospital. However, as use of smartphones and other personal IS had increased significantly throughout the last years, doctors and nurses had an increasing amount of ITs at hand to make and exchange pictures. At Hospital, the number of patient pictures taken by medical professionals was growing strongly and doctors also increasingly used WhatsApp to share these pictures. This stood in sharp contrast to Hospital's policy and management grew increasingly concerned.

Our data showed that Hospital's professionals used various ITs for PPP. Personal mobiles were a prominent means for making patient pictures with representatives of some departments reporting more than a hundred pictures a day being taken by using personal mobiles. Prior to the use of personal mobiles increasing, we were told that other, non-authorized devices such as personal computers, hard drives, or cameras were used for PPP. These devices seemed well aligned with several goals that Hospital had to pursue. For example, some cameras could make very high-resolution pictures that would meet some of the highest standards for medical analyses. However, counter to Hospital's policy, pictures would not be stored in the EMR, but on cameras and various hard drives. Informants provided fairly pragmatic reasons for why they chose to circumvent the EMR. For example, cameras would facilitate easy taking and sharing of high-quality pictures. In contrast, informants described the transfer of pictures into the EMR as rather tedious

given the time that it took. Transferring pictures into the EMR consisted of seven steps that professionals had to perform for every single picture anew for legal reasons. Steps included, for example, tagging a patient's personal information in a picture, or entering a patient ID. In sum, the steps were so many that informants described it as infeasible to perform them during consultations with patients. Therefore, the steps had to be done after the consultation.

The abovementioned requirements for performing seven steps for transferring pictures into the EMR led to many professionals using personal mobiles for PPP instead. Doctors reported several reasons for that which were linked to the EMR prohibiting doctors pursuing several of Hospital's goals. First, doctors reported that the quality of pictures would suffer once they were integrated into the EMR. The latter was programmed to optimize on server space, which is why the EMR reduced pictures in size and quality during the upload process. Doctors reported the quality of the uploads as poor and insufficient for medical decision making. Particularly, patient pictures were decisive elements in therapeutic decisions regarding several conditions. For example, when making decisions on how to treat cancer, doctors would call in a meeting with colleagues, display pictures on large screens or video projectors so that all colleagues could inspect the condition. However, doctors reported that the quality of the pictures in the EMR was too poor to be used in these meetings.

A second quality-related reason why doctors avoided integration of pictures into the EMR was that they needed both high quality of pictures and specific tags on the photos for publishing research as well as training residents. Prior to the implementation of the EMR doctors used their own localized databases to store pictures and teach courses. They continued with this practice well into the EMR implementation as the latter did not provide workflows that suited to research and teaching as the following quote illustrates: "*Photos are used to make medical decisions and we use them a lot for scientific publications. Pictures are made with high resolution; these pictures are displayed to colleagues so the quality must be good enough, and for the publications too.*" (Interview doctor). Thirdly, doctors were concerned that technical bugs in the EMR disrupted their workflow. For example, it was reported that the EMR would sometimes display pictures only partially so that important information was missing and treatment decisions could not be made.

Against this background, personal mobiles enabled doctors to take high-quality pictures quickly and share them with colleagues within and outside of Hospital swiftly. Doctors were aware of the liability issues involved with sharing patient pictures through applications such as WhatsApp. Hence, they called for an application that would enable them to share pictures easily while meeting legal requirements for exchanging sensitive data. Furthermore, doctors also reported that they no longer wanted to store patient pictures on their personal mobiles.

In slight contrast to doctors, nurses used Hospital's EMR comparatively more for storing pictures. This resulted from nurses not having to pursue as many different goals as doctors had to. For example, nurses were not involved in decision making as much as doctors were. Also, nurses did not publish papers and neither did they engage in informal counselling with doctors outside of Hospital. Table 2 summarizes different technologies used by doctors for PPP as well as why they were seen as better than Hospital's EMR.

Practices	Technology	Reasons to use a specific technology	Reasons to not use EMR
Making therapeutic decisions	Personal mobile Camera	Provide sufficient quality	Length of the uploading pictures to and downloading pictures from the EMR Quality of pictures decreased during upload
Informal counselling	Personal mobile WhatsApp	Ease of sharing	Difficulty to share pictures Impossibility to share pictures outside the hospital via EMR
Training medical students and residents	Personal mobile	Personal data bases	Impossibility to gather photos for personal data bases.

Make research and publish	Personal mobile Local databases	Clinical data bases	Impossibility to gather photo for clinical data bases

Table 2. Goals and Technologies used for the PPP

The Impact of XPhoto on Patient Picture Processing

Concerns with using personal mobiles for PPP led to a point where a department called 'Delegation of Hospital Information' intended to implement a new app ('XPhoto'). XPhoto was supposed to integrate personal mobiles with the EMR and thus to reduce security and data privacy risks inherent to using apps such as WhatsApp for PPP. Xphoto was envisioned to be capable of working on personal mobiles, automatically storing pictures in the EMR and to respect all relevant security measures at the same time. The head of the delegation who led implementation of Xphoto was a doctor himself.

Implementation of XPhoto began as project devoted to testing how XPhoto would play out in practice. To this end, the doctor behind XPhoto needed to get permission of Hospital's IT department to test XPhoto. The department approved of it, but warranted that the test could only be conducted by use of specific mobiles under control of the IT department. This led to ten medical professionals volunteering to test XPhoto (eight doctors; two nurses) between February and September 2016.

Between September 2015 and February 2017, XPhoto was implemented aiming at overcoming the use of non-authorized IS and eliminating the seven steps process needed to upload pictures into the EMR (see above). XPhoto was planned to automate and speed up this process. Meetings that were held to accompany the implementation of XPhoto brought together different stakeholders involved with XPhoto such as doctors in charge of running the project, Hospital's IT department, managers in charge of managing patient identities, as well as representatives of the legal, quality assurance, and risk management departments. Representatives of identity management and Hospital's IT department insisted on the importance of doing PPP according to protocol that prescribed transferring pictures into Hospital's official EMR. Doctors stressed the diversity of goals they had to pursue and that the EMR including the manual uploading would obfuscate pursuing these goals.

XPhoto emerged as acceptable solution to these different stakeholders. The IT department wanted to avoid setting up a secure container for bring your own device (BYOD) applications and XPhoto could respond to this. Similarly, Xphoto was seen as feasible solution to respond to concerns regarding patient identities and avoiding risks related to unauthorized access to medical information. As XPhoto would be connected to Hospital's EMR, the app could comply with the aforementioned concerns regarding risk and security. Similarly, XPhoto would automatically upload pictures from a personal mobile into the EMR, index pictures, and delete them from a personal mobile. Therefore, it was seen as a feasible compromise by doctors, who could continue using personal mobiles for PPP. During the test, therefore, a formal tutorial on how to use XPhoto for PPP was implemented.

Interviews conducted after the test of XPhoto revealed that doctors continued using different devices to capture, store or share pictures largely due to the variety of goals that they pursued. Two doctors reported XPhoto as useful for patient care as XPhoto enabled them to no longer store pictures on personal mobiles. Likewise, other doctors also stated that XPhoto helped with capturing and storing pictures into the EMR, but that XPhoto was still insufficient to deliver photos that would be useful for teaching, research, informal counselling, or telemedicine.

Once the test was completed, the IT department put XPhoto on hold. Representatives of the department stressed that implementation would be too costly and that integration of all different personal mobiles in-use by medical professionals would be too difficult as it disclosed several technical problems. Therefore, Hospital's doctors continued to use several different non-authorized systems for PPP despite knowing that this violated Hospital's policy. Hospital's management tolerated it despite of its substantive risks.

Case Analysis

Consistent with Berente and Yoo (2012), our case analysis comprises two parts. First, unpack the institutional logics in our case using Berente and Yoo's (2012) dimensions of logics. Second, we develop a process model explaining how these logics informed the persistence of the paradox that we observed.

Institutional Pluralism at Hospital

Our evidence suggests that Hospital is a pluralistic organization subject to different institutional logics prescribing several different goals (Berente and Yoo 2012). We summarize these logics in Table 3. Consistent with Berente and Yoo (2012), we structure each logic into the dimensions of principles, assumptions, identity, and domain (see, e.g., tables 4-6 below).

Logic	Goals
Logic of health care provision	Delivering excellent health care; providing good supervision of residents; doing informal counselling
Logic of research and teaching	Doing research; publishing; providing training to medical students and residents
Logic of bureaucratic control	Managing Hospital efficiently and securely; ensuring compliance with the all and accountability to the public

Table 3. Overview of Institutional Logics in our Case

The first logic that we found is a logic of health care provision. The principle inherent in this logic is that Hospital aimed to provide excellent care to its patients. Such excellent care is assumed to require knowledge exchanges with other professionals, for example, through jointly discussing a patient picture at hand in order to reflect on what the particular condition of the patient may be. To this end, according to Hospital's doctors, pictures ought to have high quality. Hence, while Hospital's IT department called for storing pictures in the EMR, doctors frequently used other means such as WhatsApp to share pictures with one another because the quality of the pictures within the EMR did not meet doctors' requirements. Choosing what technology to use also reflects the identity that the logic of health care provision grants to doctors; i.e. that they are expert professionals who decide themselves what technology to use. This is related to the fact that Hospital's doctors were responsible for making diagnoses, supervise others, and train residents within Hospital. Doctors derived requirements for technological support of PPP from these expectations and, in fact, all doctors that we interviewed emphasized that these responsibilities required photos to be made but that these photos ought to be made by easy-to-use tools. Finally, the domain related to this logic was the provision of health care services.

The logic of health care provision prescribed goals that related closely to how patient care was supposed to be conducted. To deliver the best possible patient care was one goal requiring minimization of error in medical diagnoses and thus calling for sharing knowledge in the process of making a diagnosis. Similarly, the logic of health care provision required doctors to care for training of residents and hence making sure they acquire the knowledge needed to deliver best possible patient care.

Dimension	Characterization	Representative quotation
Principles	Provide excellent care to patients	"*In our specialty we need photos of high quality in order to discuss during staff meetings. Photos indexed into the EMR are of too low quality.*" (Interview doctor A) "*The fact that there are these pictures in the patient file also helps to improve patients' care and follow-up*". (Interview doctor B)
Assumptions	Excellent care demands knowledge exchange among	"*During the staff meeting, we share photos with USB sticks or phones. Sometimes photos are sent to external specialists to ask for an advice. And for that we send them by mail or WhatsApp.*" (Interview doctor C)

	medical professionals.	*"The first is for the sharing of data with other practitioners, particularly with dermatologists, who send us for example patients who have a small tumor and therefore it is good that we have a photo, we know what part are we talking about, what should we remove and how?"* (Interview doctor D)
Identity	Autonomous professionals choose what technology to use.	*"Because of lack of simple tools, photos are taken with our smartphones and are not indexed into the EMR."* (Interview doctor E) *"Doctors tried to facilitate communication between them in terms of efficiency, it is complicated to put photos one by one into the EMR, so they chose the simplest, WhatsApp."* (Interview doctor B)
Domain	Provision of health care services.	*"According to our medical specialty, we do not necessarily have the same habits and the same needs."* (Interview doctor B)

Table 4. Institutional Logic of Health Care Provision

The logic of research and teaching patterned how medical professionals would use patient pictures in their efforts to educate students and publish scientific findings. The logic of research and teaching is a 'hybrid logic' (Slavova and Karanasios 2018) as it combines prescriptions of research and education to which Hospital's medical professionals were subjected to. In fact, the prescriptions aligned in how they prescribed use of patient's photos. Particularly, this logic builds on the principle that patient pictures play a central role in both research and teaching. The following quote illustrates how Hospital's doctors intended to use pictures for both of these purposes: "*When I see a particular case and I think that maybe I could make a publication or use the case for a course, I take another picture with my own camera.*" (interview doctor) In a teaching context, doctors would use photos to exemplify theory to students. In the context of publishing research, doctors would use pictures as evidence for their claims in a paper. Pictures were thus decisively important in both contexts.

Similar to the logic of health care provision, the assumption inherent to the logic of research and teaching is that pictures are only useful for doing research and teaching when photos are of high quality or tagged very specifically. This informs that doctors frequently circumvented Hospital's EMR and turned to using non-authorized systems for making pictures. For example, in the teaching context, doctors would frequently encounter situations in which they deemed a particular condition of a patient to be particularly useful to be used in the classroom. As they deemed the quality of pictures in the EMR to be insufficient for such exemplification, they would turn to various other systems for taking a picture. In terms of the identity inherent to this logic, it calls for easy access to information, which largely derives from the role of doctors as researchers and teachers. Both of these roles require attention to other things and the general workload needed to carry out the according tasks was described as significant. Thus, medical professionals wanted IT to tie in very easily with their roles as researchers and teachers. Finally, the domain of this logic are the activities of actually doing research and teaching.

The goals prescribed by this logic derive from the logic's focus on research and teaching. In other words, the logic calls for doctors doing research and deliver education to students in order to assure that Hospital could live up to its mission as a university hospital.

Dimensions	Characterization	Representative quotation
Principles	Using patient pictures for education and publishing.	*"An example of a photo for educational use: the scar of a young patient due to an inflammation caused by the nets at the operation, which may be used for a demonstration in staff meetings for the young doctors and students because it is a rare case."* (Interview doctor B) *"For example, I use pictures to make a review. We make also communications, scientific papers."* (Interview doctor E)
Assumptions	High-quality photos are	*"When I have a particular case where I say that (…) it is an interesting case that would allow me to illustrate a course or*

	important means for research and teaching.	*something like that, I take a picture anyway with my personal camera at that moment."* (Interview doctor F)
		"I made the test of XPhoto, and we need also a research use, we need to save the photos on a specific theme on our smartphones." (Interview doctor B)
Identity	Researchers and teachers require easy access to information.	*"If one day I want to find for example all the photos of ears that have been removed, to watch the deformations, I cannot do it through the EMR use. Because it cannot process a photographic database."* (Interview doctor C)
		"What would be nice is not just to put the picture into the EMR but to have a search engine by type of disease, e.g. skin infection, after tagging the photos." (Interview doctor D)
Domain	Doing research and teaching.	*"We make projections of a lot of photos for our students when we have photos on interesting cases."* (Interview doctor B)
		"We use photos a lot for scientific publications, research is one part of our activity." (Interview doctor C)

Table 5. Institutional Logic of Research and Teaching

The logic of bureaucratic control patterned how Hospital's management as well as departments for IT, risk management, and security approached data privacy and IS security. This logic contradicts the former two logics in several ways as they emphasize on decentralization and professional autonomy in decision making while this logic emphasizes on efficiency and integration. Particularly, the principle inherent to this logic relates to organizing for efficiency and compliance with principles of public management. Both were related to the fact that Hospital operated on tax money so that accountability to the public was of major importance. For example, the decision to optimize on server space and therefore rendering pictures in the EMR small related to this principle. Small pictures would save space which, in turn, saved money.

The logic of bureaucratic control builds on the assumption that efficiency and compliance require strict adherence to formal protocol. Provided that Hospital as a public organization needed to be particularly concerned about meeting privacy demands, the assumption emphasizes that it is forbidden to use non-authorized IS for PPP as this is illegal. Consistent with this emphasis on using one centralized EMR for PPP is the identity that dedicated departments within Hospital should decide who would use what IT for which purposes. Therefore, the departments for IT and managing patient identity have put strong emphases on their legitimation to both prescribe how organization members ought to use IT and what IT they should use. This centralization stands in stark contrast to the logics of health care provision as well as research and teaching with their emphasis on the autonomy of professionals to make these decisions. Finally, the domain of bureaucratic control is the management of all operations within Hospital, which is another reason why this logic clashes with the other logics as they relate to several important operations, too.

Goals prescribed by bureaucratic control relate to reaching best possible efficiency while ensuring that the information that is produced is of high quality and reliable. Moreover, ensuring security of data and the overall IT setup are key goals of bureaucratic control.

Dimension	Characterization	Representative quotation
Principles	Organizing for efficiency and compliance.	*"The photo resolution is automatically decreased when it is indexed into the EMR in order to save the EMR store memory."* (Interview doctor E)
Assumptions	Efficiency and compliance require sticking to protocol.	*"On the ground, there is an anarchical use of pictures, which are stored on the personal smartphones. (...) We cannot only say that we have to obey the law."* (Interview doctor A)
		"The use of personal mobiles is not authorized for PPP." (Interview doctor B)

Identity	Dedicated departments for IT and risk management decide who uses what IT and for what purpose.	*"Make sure to delete photo files from camera memories, your PC or any other place where you have temporarily stored it."* (Tutorial for the indexation of patients' picture into the EMR)
		The minimum security conditions required to implement the flow of information between the application are validated by the IT department, the hospital information manager, and the data privacy officer" (Email of the DHI manager)
		"All the users must follow the process." infor
Domain	Overall hospital management.	*"Doctors do not have to store patients' data on their personal phones".* (Meeting of the DHI manager and IT manger)

Table 6. Institutional Logic of Bureaucratic Control

A Process Model of Persistent Paradoxes

We draw on the institutional logics outlined above in order to theorize how paradoxes persist based on our observation that doctors continued to use non-authorized systems and management let them proceed despite the fact that this practice violated the law and Hospital's policies. Figure 1 summarizes our process model depicting how we intent to explain why paradoxes persist over time. Consistent with works on the relationship between more latent structures and local practices (Barrett and Walsham 1999; Berente and Yoo 2012; Oborn et al. 2011), our intent with the figure is to visualize the relationship between institutional logics, paradoxes, and agency as process of continuous enactment with the circularity suggesting that enactment unfolds over time as process. Moreover, for reasons of parsimony, our model relies on two institutional logics while these could theoretically be more.
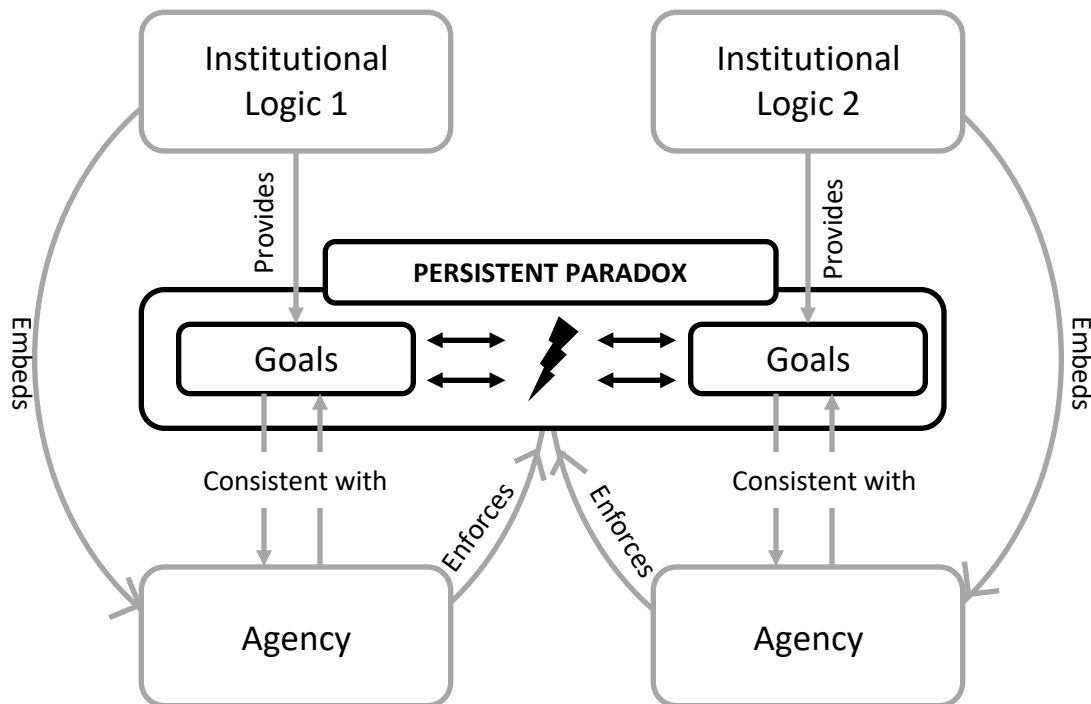
Figure 1: A Process Model of Persistent Paradox in Pluralistic Organizations

Managerial strategies to resolve paradoxes such as the implementation of XPhoto at 'Hospital' have received increasing attention in IS research (Gregory et al. 2015) as well as organization theory (Jay 2013; Smith and Besharov 2019; Smith and Lewis 2011). However, we saw the implementation of XPhoto being stopped and management letting doctors use non-authorized systems regardless of the obvious risks involved. How was this possible? We suggest that the answer to this question lies in understanding more broadly how diverging institutional logics embed agency of their constituents and how acts of agency let

paradoxes persist. In terms of our case, doctors derived reasons for continuously using non-authorized IS from the goals that they were pursuing. In contrast, Hospital's IT department derived its decision to put XPhoto on hold from its goal to maintain efficiency and security of Hospital's IT operations. Each decision made sense on a local level, but let doctors' use of messengers such as WhatsApp persist.

Competing institutional logics provide contradictory structures (Beck et al. 2015; Berente et al. 2019; Berente and Yoo 2012; Hultin and Mahring 2014) that let paradoxes emerge in organizations (Robey and Boudreau 1999). We build on this idea to suggest that, once emerged, the paradoxes can persist because of the goals that logics prescribe and the agency of actors to pursue these goals. In terms of goals, logics can prescribe different goals that organizations should achieve (Pache and Santos 2010), for example, Hospital was expected to deliver excellent care, publish papers, do clinical trials, teaching, and be efficient. Such diverging goals inform the agency of actors in terms of how they pursue these goals (Berente and Yoo 2012; Pache and Santos 2010). Such pursuit often involves pragmatic agency that is focused on 'getting the job done' (Emirbayer and Mische 1998; Smets and Jarzabkowski 2013). Emphasizing on pragmatic actions is important because it highlights that many organization members may not be oriented at maintaining or enacting a particular logic per se, but more on how to do what they are supposed to do (Emirbayer and Mische 1998). For example, doctors used WhatsApp in order to quickly share patient pictures or avoided Hospital's EMR because its minimization of images rendered these useless for doctors to inspect particular conditions. Likewise, from a managerial perspective, abandoning XPhoto was pragmatic as costs were escalating and keeping them at bay was a goal that management had to live up to. Hence, when seen in isolation, each of these decisions made sense against the background of particular logics, but the combination of these decisions rendered the situated puzzling. As such, these actions were consistent with particular institutional logics, but primarily oriented at solving concrete problems (see also, Smets et al. 2012, 2015). Taken together, our observations suggest that diverging goals stemming from different logics lead to pragmatic agency intra-organizational constituents of logics. They enforce a paradox through pursuing these goals through actions that make sense when seen against the backdrop of one respective logic yet paradoxical when considered in combination.

Discussion

Building on our case and process model, we next discuss contributions to theory and practice as well as the limitations and conclusions of our paper.

Contributions to IS Theory and Practical Implications

Our study offers contributions to building theory on paradoxes and institutional logics, respectively. IS researchers have stressed that paradoxes are pervasive features of IS implementation and governance (Gregory et al. 2015; Robey 1997; Robey and Boudreau 1999). Paradoxes are particularly challenging to manage as they frequently entail situations where managers must strike a balance between contradictory elements (Gregory et al. 2015). The thrust of the literature on paradoxes in management and IS research has thus been on how paradoxes can be resolved (Gregory et al. 2015; Jay 2013; Smith and Lewis 2011). Our study contributes to this research by bringing to the fore that paradoxes can persist and managerial response strategies can come to a halt. Our process model highlights that pragmatic decisions of constituents of different institutional logics can lead to a paradox persisting on the organizational level. We were able to identify the process that leads to this persistence by differentiating between the goals that different logics prescribe and the pragmatic decisions that constituents of different logics make to pursue these goals. When viewed in isolation, each of these decisions was consistent with a particular logic at hand, but their combination within the same organization seemed absurd. Concretely, doctors used non-authorized IS to process patient pictures, which was consistent with providing excellent care. Similarly, the decision to abort the implementation of XPhoto was consistent with a logic of bureaucratic control and its emphasis on cost containment. However, on the level of the organization this produced a situation where doctors simply continued to use non-authorized IS for patient picture processing despite the obvious risks involved and management knowing of this situation.

The concept of 'institutional logics' has been used in IS to study how multiple institutional prescriptions affect IS implementation (Berente et al. 2019; Berente and Yoo 2012; Boonstra et al. 2017; Hultin and Mahring 2014; Jensen et al. 2009). This literature has brought to the fore that IS often 'carry' logics of efficiency and control that may clash with logics that professionals within organizations advocate (Berente

et al. 2016; Gosain 2004; Lyytinen et al. 2009). This was the case with Hospital's EMR emphasizing on tight integration and control and, indeed, economization through rendering pictures small in order to save server space. Literature has identified that there may be various responses to the implementation of such systems, including loose coupling (Berente and Yoo 2012), resistance (Berente et al. 2019) as well as use of IS for the purposes of professionals (Hultin and Mahring 2014). The general thrust in these studies is that professionals become subjected to new systems in one way or the other and find ways of dealing with them even if this entails resistance. Our study highlights how professionals circumvent a new system and management aborts its implementation leading professionals using IS that are highly problematic from legal and business policy perspectives. This becomes possible through macro-level institutional logics informing micro-level pragmatic agency that sustains the paradox on the organization-level. This is different from loose coupling as it demands some form of responsiveness between a new system and user practices (Berente and Yoo 2012) but, in our case, the implementation of the new system was stopped. This is also different from resistance (Berente et al. 2019) because we highlight that pragmatic reasons to use certain IT lead to the emergence of the paradox. In contrast, the literature on resistance often suggests a certain drama to accompany implementation processes (Berente et al. 2019). On the opposite, we did not find this drama to occur. Instead, doctors seemed to understand that non-authorized systems were not safe enough, however, for various purposes they were simply more practical. Finally, paradoxes are also different from using a new IT for the purposes of a profession since this suggests integration of a new IT into an existing professional logic (Hultin and Mahring 2014). In contrast, a persisting paradox suggests that diverging elements co-exist. In turn, our contribution to literature is important as it uncovers a different consequence of how multiple institutional logics affect IS implementation.

Finally, our study offers a new take on how we conceptualize 'persistence'. The term 'persistence' is widely used in literature on paradoxes (Smith and Lewis 2011), inertia (Jansen 2004), and path dependency (Sydow et al. 2009) and widely understood as somehow limiting agency. We suggested to understand persistence in terms of trajectories within which actions to develop dynamically. This enabled us to unpack how micro-level actions contribute to the persistence of an organization-level paradox and, therefore, our argument foregrounds that persistence of paradoxes exists exactly because there is agency on a lower level of analysis.

In terms of practical implications, our work suggests that organizations should not underestimate tensions that undergird paradoxes. In our case, we saw interplays of macro-level structures and micro-level agency to produce a paradox on the organizational level. A general practical take-away from our study is thus that managements need to reach out to other logics more strongly and, if possible, adjust their diverging goals. For example, a reason for doctors not to use Hospital's EMR was that it reduced the resolution of images for cost reasons. A different design more in line with the logics that guided medical professionals thus seems important to facilitate successful implementation. Regarding policies for data privacy and protection, our study warrants that such policies may sometimes be insensitive towards goals that organization members pursue as well as what IS they use to reach these goals. It thus seems important to release business policies or organization-wide guidelines that take into the institutional embeddedness of important users within organizations in order to situate topics such as data privacy within their life worlds.

Limitations

Our study is limited by virtue of our single case methodology. It was appropriate because we intended to build more than test theory (Edmondson and McManus 2007) . Yet, it will be important to test and refine our model through applying it in other contexts. This may allow identification of different pathways leading to persistent paradoxes and different conditions under which it may be possible to bring the process to a halt. Furthermore, even though we tried to apply utmost rigor in our analysis and only included observations into our argument once they could be cross-validated, the nature of our data implies that facets may have slipped from view and details missed. Based on our engagement with the field, we believe this not to be the case but, as is common in qualitative work, this possibility cannot be ruled out entirely.

Conclusion

In times where organization members increasingly use personal devices for organizational purposes, it becomes important to understand how such use affects organizations. We developed a process model depicting how the use of personal mobiles and other non-authorized IT let paradoxes persist in

organizations. We believe that this adds an important nuance to extant discussions about IT governance and implementation. While much remains to be done, we hope that our paper charted some important territory in this regard.

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